

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An arrayed waveguide-embedded optical circuit comprising:

a waveguide;

a groove formed across the waveguide; and

two or more spot-size transformer pairs whose members face each other across the groove, wherein each spot-size transformer comprises a first optical waveguide comprising a first core and a first cladding and a second optical waveguide comprising a second core as an extension of the first cladding and a second cladding formed of a resin.

2. (Canceled)

3. (Currently Amended) The arrayed waveguide-embedded optical circuit in accordance with claim 2~~1~~, wherein each of the spot-size transformers further comprises a transition waveguide positioned between the first optical waveguide and the second optical waveguide and is constituted so that the width of the first core becomes gradually narrower as it goes toward the second optical waveguide.

4. (Original) The arrayed waveguide-embedded optical circuit in accordance with claim 3, wherein a first cladding substantially covers the whole surface of the first core.

5. (Original) The arrayed waveguide-embedded optical circuit in accordance with claim 4, wherein the center of the first core and the center of the second core are aligned substantially on the same axis.

6. (Original) The arrayed waveguide-embedded optical circuit in accordance with claim 5, wherein the groove is formed at an angle to a plane perpendicular to the axis of the light propagating through the spot-size transformer.

7. (Original) The arrayed waveguide-embedded optical circuit in accordance with claim 6 further comprising an optical isolator element inserted in the groove.

8. (Original) The arrayed waveguide-embedded optical circuit in accordance with claim 7, wherein the optical isolator element is provided at an angle to a plane perpendicular to the axis of the light propagating through the spot-size transformer.

9. (Original) The arrayed waveguide-embedded optical circuit in accordance with claim 6 further comprising an optical filter inserted in the groove.

10. (Currently Amended) An optical functional element ~~which can be being~~ inserted into a groove of an arrayed waveguide-embedded optical circuit which comprises a waveguide, a groove formed across the waveguide and two or more embedded optical waveguide pairs whose members face each other across the groove, wherein each spot-size transformer comprises a first optical waveguide comprising a first core and a first cladding and a second optical waveguide comprising a second core as a extension of the first cladding and a second cladding formed of a resin and wherein the optical functional element ~~has comprises:~~

a magneto-optic functional element;

first and second birefringent plates being located at positions where, when the optical functional element is inserted into the groove, one half of the beam spot of the light propagating through each pair of embedded optical waveguides is projected;

third and fourth birefringent plates being located at positions where, when the optical functional element is inserted into the groove, the other half of the beam spot of the light propagating through each pair of the embedded optical waveguides is projected; and

has regions for passing the light propagating through the two or more pairs of the embedded optical waveguides.

11. (Canceled)

12. (Currently Amended) The optical functional element in accordance with claim 10, wherein a boundary between the first and second birefringent plates and a boundary between the third and the fourth birefringent plates coincide substantially with the direction of arrangement of the pairs of embedded optical waveguides when the optical functional element is inserted into the groove.

13. (Currently Amended) The optical functional element in accordance with claim 10, wherein the first and second birefringent plates are arranged alternately on one surface of the magneto-optic functional element and the third and fourth birefringent plates are arranged alternately on the other surface of the magneto-optic functional element.

14-19. (Canceled)

20. (Currently Amended) The An optical functional element inserted into a groove of an arrayed waveguide-embedded optical circuit which comprises a waveguide, a groove formed across the waveguide and two or more embedded optical waveguide pairs whose members face each other across the groove, said optical functional element comprising:

a magneto-optic functional element;

first and second birefringent plates formed alternately on one surface of the magneto-optic functional element and located at positions where, when the optical functional element is inserted into the groove, one half of the beam spot of the light propagating through each pair of embedded optical waveguides is projected; and

third and fourth birefringent plates formed alternately on the other surface of the magneto-optic functional element and located at positions where, when the optical

functional element is inserted into the groove, the other half of the beam spot of the light propagating through each pair of embedded optical waveguides is projected.

21. (Currently Amended) ~~The~~An optical functional element comprising:
a magneto-optic functional element;
first birefringent plates formed on one side of a surface of the magneto-optic functional element intersecting a light path for passing the light at predetermined intervals;
and
second birefringent plates formed on the other side of the surface of the magneto-optic functional element at predetermined intervals.

22. (Canceled)

23. (New) An optical functional element inserted into a groove of an arrayed waveguide-embedded optical circuit which comprises a waveguide, a groove formed across the waveguide and two or more embedded optical waveguide pairs whose members face each other across the groove, wherein the optical functional element comprises:

a magneto-optic functional element;
first and second birefringent plates being arranged on one surface of the magneto-optic functional element in a checker pattern;
third and fourth birefringent plates being arranged on the other surface of the magneto-optic functional element in a checker pattern; and
regions for passing the light propagating through the two or more pairs of the embedded optical waveguides.

24. (New) An optical functional element inserted into a groove of an arrayed waveguide-embedded optical circuit which comprises a waveguide, a groove formed across the waveguide and two or more embedded optical waveguide pairs whose members face each other across the groove, wherein the optical functional element comprises:

a magneto-optic functional element;

first birefringent plates formed on one side of a surface of the magneto-optic functional element intersecting a light path for passing the light at predetermined intervals; and

second birefringent plates formed on the other side of the surface of the magneto-optic functional element at predetermined intervals.

25. (New) The optical functional element in accordance with claim 24 wherein the first and second birefringent plates are located at positions where they do not substantially face each other across the magneto-optic functional element.

26. (New) The arrayed waveguide-embedded optical circuit in accordance with claim 1, the refractive index of the material of the second cladding is lower than that of the material of the second core.

27. (New) The arrayed waveguide-embedded optical circuit in accordance with claim 1, the refractive index of the material of the second cladding is an ultraviolet curable resin.